Hydrogen and alcoholic fermentation.—Through a study of the reduction of methylene blue, in the presence of yeast, LVOFF[9] has found further evidence that reductase plays an essential rôle in alcoholic fermentation. Methylene blue is rapidly decolorized when placed in a yeast culture. This decoloration is brought about through the absorption of two atoms of nascent hydrogen (molecular H is not effective) at the double bond of the color group. Reductase activates the hydrogen. He finds the output of alcohol and CO_2 greatly lowered while the methylene blue is being reduced. Therefore the hydrogen, activated by the reductase, probably goes directly to the methylene blue molecule, thereby arresting the further normal steps of the fermentation process. Quantitative determinations of the CO_2 and alcohol produced and the hydrogen absorbed (by the methylene blue) showed that one gram-molecule of methylene blue takes from the fermentation medium one gram-molecule of hydrogen and "inactivates" one gram-molecule of hexose, thus preventing the splitting into alcohol and CO_2. Unfortunately, a study of this "inactivated" carbohydrate molecule has not been made.

Again, yeast when mixed with water only still has the capacity for reducing methylene blue. CO_2 is given off at the same time in amount directly related to the methylene blue reduced; for example, one gram-molecule methylene blue, under conditions favoring self-fermentation, takes one gram-molecule of hydrogen from the medium, liberating one gram-molecule of CO_2. The source of this CO_2 is yet unexplained. However, the author suggests the possibility that it comes from the fermentation of amino acids in the yeast, a suggestion in agreement with the work of EHRLICH, and particularly with that of BACH, where from amino acids in the presence of alloxan, NH_3, CO_2, and 2H are eliminated (the 2H passing to the alloxan), leaving an aldehyde in the medium. —E. M. HARVEY.

Cytology and embryology of Smilacina.—*Smilacina* was studied some time ago by LAWSON,[10] who reported that synapsis is due not to a marked contraction of the nuclear contents, but to a sudden enlargement of the nuclear cavity, which gives the appearance of a contraction. MCALLISTER[11] claims that synapsis is due to contraction and not to any considerable enlargement of the nuclear cavity. It would seem as if this should be settled by measurement rather than by discussion, but since both men studied *Smilacina* and both made measurements, an extensive series of measurements of various forms would seem to be in order.

---

[9] LVOFF, GERGIUS, Hefegärung und Wasserstoff. Zeitschr. Gärungsphysiol. **3**: 289–320. 1914.

[10] LAWSON, A. A., The phase of the nucleus known as synapsis. Trans. Roy. Soc. Edinburgh **47**: 591–604. *pls. 2.* 1911. Rev. in BOT. GAZ. **51**: 313. 1911.

[11] MCALLISTER, F., On the cytology and embryology of *Smilacina racemosa.* Trans. Wis. Acad. Sci. **17**: 599–660. *pls. 56–58.* 1913.

During synapsis McALLISTER finds that there is a lateral pairing and fusion of spirems, the fusion being complete at the time of the recovery from synapsis. After this recovery there is a second contraction stage. The double heterotypic chromosomes are formed, not by the approximation of the limbs of loops, but by a transverse segmentation of a longitudinally split spirem, the line of the split probably representing the line of approximation of the two parental spirems seen at synapsis.

The heterotypic and homotypic mitoses in the megaspore mother cell result in the formation of four megaspores, separated by plasma membranes. The membrane formed at the heterotypic mitosis persists, while those formed at the homotypic mitosis quickly break down. From the inner binucleate cell, thus formed, an 8-nucleate embryo sac is developed. Consequently, two megaspores are concerned in the development of the embryo sac.

Adventitious embryos develop from nucellar cells in the micropylar region, and one or more of them may become mature. The presence of pollen tubes indicates that embryos may also result from fertilization.—CHARLES J. CHAMBERLAIN.

Marine algae.—BORGESEN[12] has published an account of the marine Chlorophyceae of the Danish West Indies, based upon collections made in 1892, 1895, and 1905. The list contains 34 genera including 86 species, 4 new species being described in *Cladophora* (2), *Avrainvillea*, and *Pringsheimia.* The full field notes and the numerous illustrations make the account an exceedingly satisfactory one.

BORGENSEN[13] has also given an account of the species of *Sargassum* collected during his three visits to the Danish West Indies, partly along the coasts of the islands, and partly in the Sargasso Sea. The shore collections include 4 species, while the pelagic collections are all referred to two species. The discussion of the "biology, affinities, and origin of the gulfweed" is especially interesting. The conclusions reached are that the gulfweed of the Sargasso Sea consists of two species, *S. natans* (most common) and *S. Hystrix*, var. *fluitans;* that they are true pelagic algae, living perennially on the open sea; and that most probably they have descended from shore forms of the West Indies and the neighboring American coast. The author says "it is of great interest that we have an instance of floating, pelagic species of such a high alga type as *Sargassum;* because, as is well known, the higher types of algae are as a rule attached, and if detached they perish sooner or later."—J. M. C.

---

[12] BORGENSEN, F., The marine algae of the Danish West Indies. Part I. Chlorophyceae. Dansk Botanisk Arkiv 1: no. 4. pp. 158. *figs. 126* and *chart.* 1913. Copenhagen: H. Hagerup. *Kr* 4.

[13] ———, The species of *Sargassum* found along the coasts of the Danish West Indies, with remarks upon the floating forms of the Sargasso Sea. Mindeskrift for Japetus Steenstrup. pp. 20. *figs. 8.* 1914.